

ABSTRACT

The Centre for Best Available Techniques (BAT) has been founded by the Flemish Government, and is hosted by VITO, the Flemish Institute for Technological Research. The BAT centre collects, evaluates and distributes information on techniques that minimize the impact on the environment as a whole. Moreover, it advises the Flemish authorities on how to translate this information into their environmental policy. Central in this translation is the concept of “BAT” (Best Available Techniques). BAT corresponds to the techniques with the best environmental performance that can be introduced at reasonable cost.

This report discusses the BAT for the greenhouse industry, in particular the cultivation of vegetables, strawberries and ornamental plants. The BAT analysis was mainly carried out to propose new emission limit values for combustion plants in this sector. Another main objective was to select the BAT for energy savings and the control of light pollution. Additionally, BAT for water use, wastewater, chemicals, waste, soil, odour, and sound and vibrations have been investigated.

The BAT selection was based on a technical and socio-economical analysis of the sector, plant visits, discussions with experts, and other related studies. The drafting of the document was followed-up by an advisory committee, the composition of which is given in Annex 1. As the greenhouse industry is under high financial pressure, the economical evaluation of the techniques played a key role.

An optimal concept of the greenhouse, the production conditions and heat regulation combined with good operational practice leads to rational energy use. To optimise the efficiency, reduce energy losses and related emissions, it is important to have regular and accurate maintenance of the burners and perfectly tuned burner and combustion chamber dimensions. In order to control and coordinate the maintenance and inspection of the combustion plant it is recommended to implement a quality certification system for the boiler operation. This will demonstrate the compliance with all efficiency and safety demands, measurement obligations and environmental impact reduction. For new installations it is BAT to use the most recent burner technology (low NO_x) and boiler design to achieve low NO_x emissions.

Based on the BAT, VITO proposes new emission limit values for nitrogen oxides (NO_x) for small combustion plants. An overview of this BAT proposal is presented in the following table:

NO _x	Current VI II [mg/Nm ³ , 3 % O ₂ , dry flue gas]	BAT Proposal [mg/Nm ³ , 3 % O ₂ , dry flue gas]
Natural gas		
<i>Existing installations</i>	300	150
<i>New permitted installations</i>	150	150
<i>New, yet to be permitted installations</i>	150	80

NO_x	Current VI II [mg/Nm³, 3 % O₂, dry flue gas]		BAT Proposal [mg/Nm³, 3 % O₂, dry flue gas]	
<i>Existing installations</i>	650		650	
<i>New permitted installations</i>	250 ^a	(< 2 MWth)	250 ^a	(< 2 MWth)
	400 ^a	(≥ 2 MWth)	600	(≥ 2 MWth)
<i>New, yet to be permitted installations</i>	185	(< 2 MWth)	185	(< 2 MWth)
	400	(≥ 2 MWth)	525	(≥ 2 MWth)

a. for installations permitted between 01/01/1993 and 01/01/1996, 450 mg/Nm³ is still allowed

Current emission limit values for other pollutants, e.g. SO₂, CO and dust, for small combustion plants as prescribed by Vlarem II, are in accordance with the BAT.

BAT to prevent light pollution when assimilation light is used, is to optimize the lighting, to choose the correct fitting and to place them in an optimal way. In case of light pollution it is additional BAT to use foil at the sidewall inside the greenhouse. In case of light pollution and if energy screens are BAT, screens at the sidewall and the top inside the greenhouse are BAT.